CLAIMS

1. A method for generating a predetermined objective wave field in a medium by means of a first network comprising at least one transducer, this method comprising a learning step in the course of which signals ei(t) to be emitted by each transducer i of the first network so as to generate said predetermined wave field in the medium are determined by transmitting waves in the medium between the first network and a second network comprising at least one transducer, characterized in that the learning step comprises the following correction sequence:

(a) making each transducer i of the first network simultaneously emit a signal ei(t) determined in advance and making it possible to generate a real wave field much like the objective wave field in the medium, this objective wave field corresponding to an objective signal oj(t) for each transducer j of the second network,

(b) making each transducer j of the second network capture a signal rj(t) resulting from the wave field generated by the signals ei(t),

(c) determining a time reversed difference signal dj(-t) for each transducer j of the second network, dj(-t) being the time reversal of the difference dj(t)=rj(t)-oj(t),

(d) making each transducer j of the second network simultaneously emit the time reversed difference signal dj(-t),

(e) making each transducer i of the first network capture a signal c'i(t) based on the waves generated by the time reversed difference signals dj(-t),

(f) determining a correction signal ci(t)=β.c'i(-t) for each transducer i of the first network, c'i(-t) being the time reversal of the captured signal c'i(t) and β being a positive nonzero real number chosen in such a way that

$\beta<(\|\vec{e}\|\cdot\|\vec{d}\|)/(\|\vec{r}\|\cdot\|\vec{c}\,'\|)$ where $\vec{e}=[ei(t)]$, $\vec{d}=[dj(t)]$, $\vec{r}=[rj(t)]$, $\vec{c}\,'=[c'i(t)]$ and $\|\ \|$ designates a vector norm,

(g) correcting the signal ei(t) by subtracting ci(t) therefrom.

2. The method as claimed in claim 1, in which the correction sequence is repeated several times.

3. The method as claimed in any one of the preceding claims, in which the correction sequence is preceded by an initial step in the course of which a first value of the signal ei(t) is determined experimentally for each transducer i of the first network.

4. The method as claimed in claim 3, in which, in the course of the initial step:

- the time reversal oj(-t) of the objective signal is determined for each transducer of the second network,
- each transducer j of the second network is made to emit said time reversal oj(-t) of the objective signal,
- each transducer i of the first network is made to capture a signal e'i(t) resulting from the wave field generated by the signals oj(-t),
- and the signal ei(t)=e'i(-t) is determined for each transducer of the first network, e'i(-t) being the time reversal of the signal e'i(t).

5. The method as claimed in any one of the preceding claims, in which the vector norm is defined as follows: $\|\vec{x}\|=\|[x_m]\|=Max(|x_m|)$, where $|x_m(t)|$ designates the amplitude of the signal $x_m(t)$.

6. The method as claimed in any one of the preceding claims, in which the wave field is an acoustic wave field.

7. The method as claimed in any one of claims 1 to 5, in which the wave field is an electromagnetic wave field.

8. The method as claimed in any one of the preceding claims, in which the waves are generated by a telecommunication system.